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DE ES FR GB(71) Applicant: **SKF INDUSTRIE S.P.A.**
Corso Vittorio Emanuele II No. 48
I-10123 Torino(IT)(72) Inventor: **Bertetti, Paolo**
Lungo Po Antonelli, 163
I-10153 Torino(IT)
Inventor: **Vignotto, Angelo**
Via Montevideo, 6
I-10100 Torino(IT)(74) Representative: **Plebani, Rinaldo et al**
c/o Studio Torta, Via Viotti 9
I-10121 Torino(IT)(54) **A support unit for an idle element, in particular a non-driving wheel of a vehicle.**

(57) A support unit is described for a non-driving wheel of a vehicle, comprising a first support element carried freely rotatably within a second support element by the interposition of a plurality of rolling bodies which are grouped in a first ring in angular contact with a first pair of opposed tracks formed externally on the first support element and internally on the second support element respectively, and a second ring cooperating with a second pair of opposed tracks formed externally on an annular element fitted externally onto the first support element and internally on the second support element; the annular element is maintained in cooperation with the rolling bodies of the second ring by respective cotters housed in an annular groove formed externally on the first support element and locked in this by a retaining ring fixed exclusively to the said annular element.

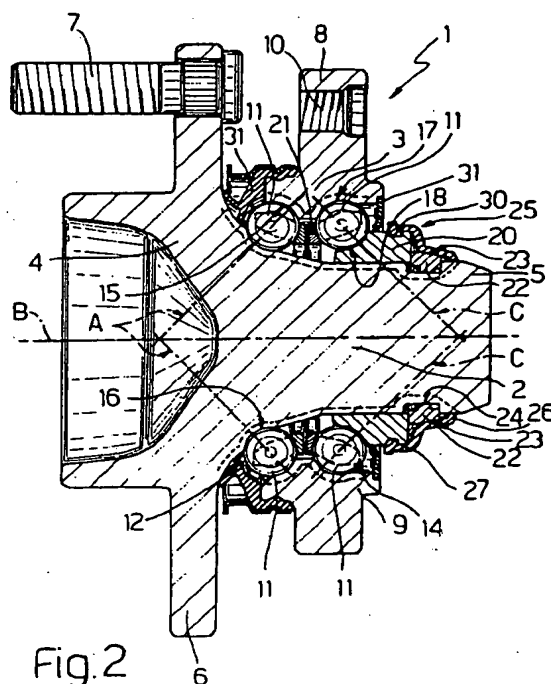


Fig.2

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The outer ring 3 is freely rotatable mounted on the stub axle 2 which passes therethrough with the interposition between them of a plurality of rolling bodies, in the specific example balls 11. These are arranged in two spaced groups or rings 12, 14 of adjacent rolling bodies, in angular contact with the elements 2, 3, with the ring 12 cooperating with a pair of opposed annular tracks 15, 16 and the ring 14 cooperating with a pair of opposed annular tracks 17, 18. In the specific example the tracks 15, 16 are nearer the end 4 and are axially offset in such a way that the radial contact axes, indicated A, between these and the balls 11, along which, in use, the thrust is transmitted between the elements 2 and 3, are inclined towards the axis of symmetry and rotation of the stub axle 2, indicated B, and converge towards the end 4; similarly the tracks 17, 18 are specularly disposed with respect to the tracks 15, 16, nearer the end 5 and axially offset in such a way that the radial contact axes C between these and the balls 11, are inclined towards the axis B and converge towards the end 5: in substance, the assembly of elements 2, 3, 11 and the associated tracks 15, 16, 17, 18 defines a known angular contact rolling element bearing having two rings of balls.

The end 5 of the stub axle 2 projects through the outer ring 3 beyond the extremity 9 of this latter; the tracks 15, 16 are formed respectively on the inner surface of the element 3 and the outer surface of the stub axle 2, close to the flange 6; on the other hand, whilst the track 17 is formed on the inner surface of the ring 3 adjacent the track 15, the track 18 is formed on an annular element 20 not forming part of the stub axle 2, but mounted externally of and fitted to this latter, in the specific example with a loose coupling able to ensure a small predetermined radial clearance sufficient to allow, in a known way, and which therefore is not described, adjustment of the clearances between balls 11 and tracks 15, 16, 17, 18 to be effected. In this way it is possible to arrange, within the same external dimensions of the unit 1, a large number of balls 11 between the elements 2, 3 for example by first forming the ring 12 directly on the stub axle 2, then mounting the ring 3 by fitting it axially over the stub axle 2 from the end 5, then forming ring 14 and finally mounting ring 20 onto the stub axle 2 by fitting it axially from the end 5: during assembly and, then, in use, the balls 11 are held in position in a known way by a cage 21.

According to a first characteristic of the invention, the ring or annular element 20 is axially locked on the stub axle 2 after insertion thereon by clamping it against the balls of the ring 14 by means of two or more known cotters 22, which consist of segments of a ring delimited by a conical external lateral surface 23 the narrow end of

which faces towards the end 5; these cotters 22 are engaged with their radially inner portions within an annular groove 24 formed externally on the end 5 of the stub axle 2 in a position such that the cotters 22, once engaged in it and, therefore, axially locked on the stub axle 2, can contact the ring 20 to retain this in position against the balls 11, between the outer ring 3 and the groove 24; the cotters 22, which are inserted into the groove 24 from a position radially outwardly thereof after assembly of the element 20, are in turn retained in position within the groove 24 by a retaining ring 25.

The retaining ring 25 is in the specific example defined by a cup-shape element made of sheet metal, which according to the principal characteristic of the invention, is fixed exclusively to the annular element 20. In particular the retaining element 25 is fitted with clearance onto the end 5 with its concavity facing towards the end 4 and in this way its frusto-conical portion 26 cooperates with the lateral conical surface 23 of the cotters 22, radially clamping these into the groove 24 by contact from the outside. Locking of the retaining element 25 onto the annular element 20 is effected by means of a second portion 27 of the retaining ring 25, of greater diameter, which is, for example, swaged over an outer lateral surface of the annular element 20 into an annular recess 30 formed thereon if need be. As usual, the balls 11 are finally protected by known sealing assemblies 31 which are carried by the ring 3 and which cooperate at one end with the stub axle 2 and at the opposite end with the ring 20.

In use, the retaining element 25 not only maintains the cotters 22 engaged in the groove 24, thus maintaining the unit 1 assembled, but furthermore ensures an angular frictional connection between the cotters 22 and the element 20 on which the element 25 is fixed. With this simple arrangement, therefore, the disadvantage of currently known similar arrangements is completely avoided in that any relative rotation between the cotters 22 and the ring 20 about the axis B is made impossible by the retaining element 25 which thus performs a further function with respect to the known support units according to the above cited UK Patent 1570849. Rapid wear of the elements 20, 22 in use, which is possible in similar support units known in the art, is therefore avoided.

Claims

1. A support unit for an idle element, in particular a known-driving wheel of a vehicle, of the type comprising first and second coaxially and relatively rotatably mounted support elements; first and second rings of rolling bodies interposed between the said first and second support ele-

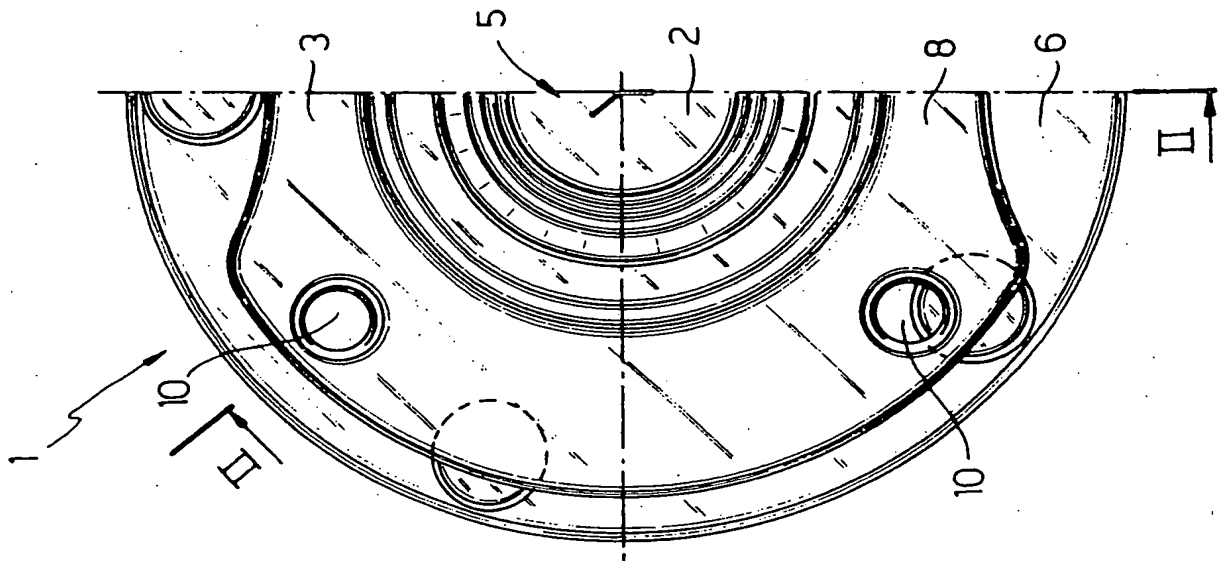


Fig. 1

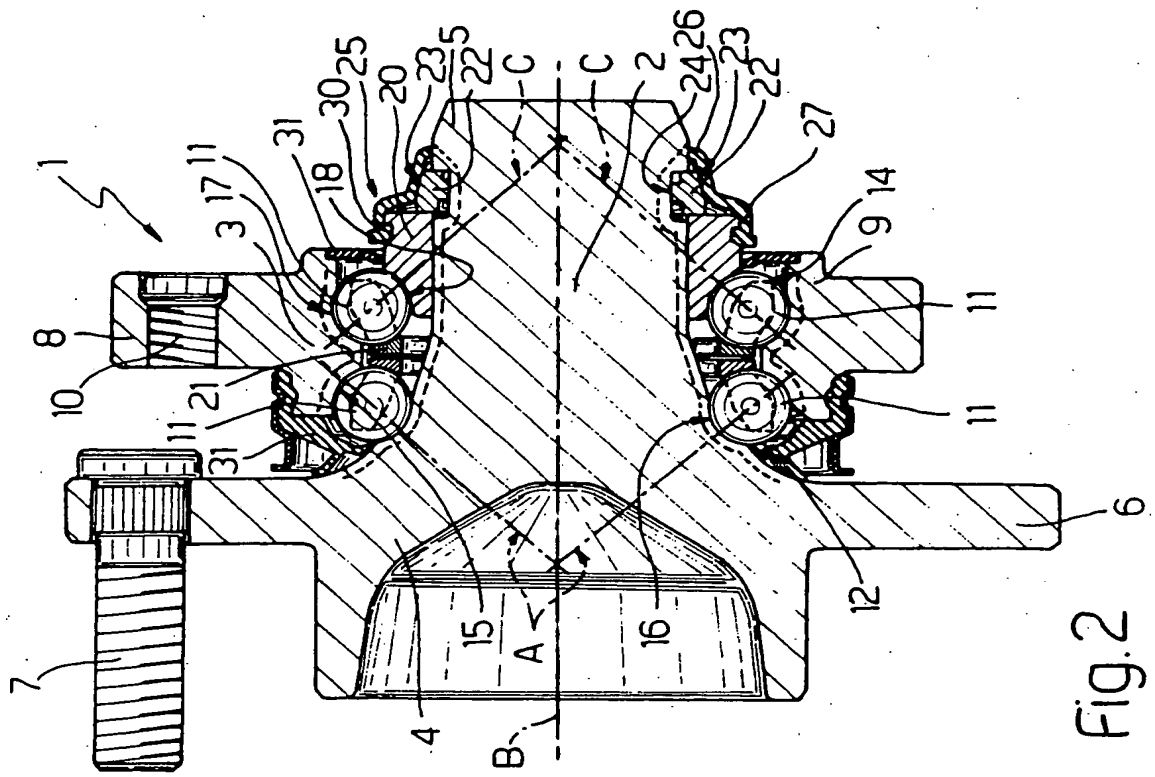


Fig. 2